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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/760,443	01/20/2004	Larry S. Eoff	2001-IP-005267UIPI	9208
7590	08/08/2007			
Robert A. Kent Halliburton Energy Services 2600 South 2nd Street Duncan, OK 73536-0440			EXAMINER FIGUEROA, JOHN J	
			ART UNIT 1712	PAPER NUMBER
			MAIL DATE 08/08/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/760,443	<b>Applicant(s)</b> EOFF ET AL.	
	<b>Examiner</b> John J. Figueroa	<b>Art Unit</b> 1712	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 May 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 77-88, 107-112 and 187-203 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 77-88, 107-112 and 187-203 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>4/16/2007</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Amendment***

1. The 35 U.S.C. 102(b) rejection of claims 77-86, 88, 107-112, 187-195 and 197-203 as anticipated by United States Patent Number (USPN) 4,532,052 to Weaver et al. (hereinafter 'Weaver') has been maintained for reasons previously made of record in item 4 on page 3 of the Office Action mailed February 21, 2007 (hereinafter 'OA').
2. The 35 U.S.C. 103(a) rejection of claims 83, 86-88, 192 and 195-197 as unpatentable over Weaver in view of USPN 6,358,889 B2 to Waggenspack et al. (hereinafter 'Waggenspack') has been maintained for reasons previously made of record in item 6 on page 6 of OA.

### ***Claim Rejections - 35 USC § 102***

3. **The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.**
4. Claims 77-79, 81-88, 107-112, 187, 188 and 190-203 are rejected under 35 U.S.C. 102(b) as anticipated by USPN 3,271,307 to Dickson et al. (hereinafter 'Dickson').

Dickson discloses branched polyalkylene polyamines that are additives for treatments of subterranean formations (e.g., as demulsifiers or corrosion inhibitors), such as aqueous compositions useful in acidizing oil wells, said branched polyamines

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having a backbone base polyamine (or derivative thereof) hydrophilic polymer and an alkylene branch that can be, e.g., butylene (4 carbons) or other homologs, straight-chained or branched. (Col. 1, lines 13-50; col. 2, line 16 to col. 3, line 5) These compounds can undergo acylation (to form, e.g., acrylate or methacrylate derivatives); can be reacted with an alkenyl succinic acid derivative (col. 3, lines 50-68; col. 5, lines 8-55; col. 6, lines 43-73); and/or can undergo alkylation/oxyalkylation (to form a hydrophobic branch) with, e.g., an alkylating agent, butylenes oxide or octylene oxide (col. 10, lines 1-16; col. 15, lines 56-66; col. 19, lines 25-59; col. 24, lines 39-53; Table II; Examples 1-3).

Dickson also discloses that these branched compounds have numerous uses in processes involving water flooding in a subterranean formation and have several advantages, such as not forming precipitates, good anti-corrosion properties and having strong bactericidal action. (Col. 31, line 72 to col. 32, lines 39) These compounds are stable reagents even in the presence of acids and, thus, can be applied satisfactorily to wells that have been acidized with hydrochloric or hydrofluoric acid. (Col. 41, lines 9-20; col. 50, 52-63)

In columns 38-43, Dickson further discloses an example whereby an aqueous treatment solution, having dispersed therein 5-25% by wt. of the aforementioned compounds, can be injected into a well that has been acidized to remove mud sheath from the interior of the well. (Col. 38, lines 48-63; col. 41, lines 10-20 and 50-75; Example on col. 42; claims 1-8) In another Example, Dickson discloses injecting the branched compounds in a treatment solution to fracture the formation. (Columns 43-47)

Aqueous formation treatment compositions containing these water-soluble branched polymer compounds can further include clays, weighting agents, gel-forming viscosifiers and/or stabilizers. (Col. 38, line 64 to col. 39, line 11)

Although Dickson may not explicitly disclose all the physical properties of the disclosed branched polymer compounds, or compositions comprising thereof, that are recited in the claims (such as modifying fluid permeability or diverting the treatment fluid to another subterranean zone), because the water-soluble branched polymers/compositions disclosed by Dickson are encompassed by the water-soluble branched polymers/compositions recited in the method of the instant claims, then they must inherently possess the same physical properties, such as its ability to modify the surface permeability of a subterranean formation and/or divert a treatment fluid upon their addition into an oil well.

Thus, the instant claims are anticipated by Dickson.

***Potential Allowable Subject Matter***

8. Independent claims 77 and 187 would be allowable if rewritten to limit the hydrophilic polymer to contain the chitosan species and to further limit the hydrophobically modified water-soluble polymer to be the reaction product of a hydrophilic polymer (backbone) and a hydrophobic compound (branch); and the hydrophobic branch to comprise an alkyl group of from about 4 to 22 carbons without any intervening atoms.

The prior art of record of record does not teach or suggest a method of acidizing that includes an injection operation whereby a RPM containing the hydrophobically-modified hydrophilic polymer recited in claims 77 and 187, as amended, is injected into a subterranean formation, wherein the hydrophobically modified water-soluble polymer is the reaction product of a hydrophilic polymer (backbone) and a hydrophobic compound (branch), the hydrophobic branch comprising an alkyl group of from about 4 to 22 carbons without any intervening atoms, and wherein the hydrophilic polymer comprises chitosan. (Examiner notes that similar claims have been indicated as potentially allowable during the examination of related application, U.S. Pat. Appl. Serial No. 10/763,800.)

### ***Response to Arguments***

#### ***The 35 U.S.C. 102(b) Rejection over Weaver (item 6 of OA)***

8. Applicant's arguments presented in the "Remarks" section of the response to OA filed May 21, 2007 (hereinafter 'Response') regarding the 35 U.S.C. 102 rejection as anticipated by Weaver have been fully considered and deemed unpersuasive.

In response to Applicant's primary arguments that Weaver discloses "another aspect of the invention [wherein] *another* class of polymers can be prepared which have *some* hydrophobic ... branches ... and *increases* the permeability of the formation to aqueous fluids, disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments. *In re Susi*, 440 F.2d 442, 169 USPQ 423 (CCPA 1971). A reference may be relied upon for all that it

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would have reasonably suggested to one having ordinary skill the art, including nonpreferred embodiments. *Merck & Co. v. Biocraft Laboratories*, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), *cert. denied*, 493 U.S. MPEP §2123. Applicant has merely cited from Weaver's discussion of one particular class of branched polymers from the plethora of classes of these polymers disclosed in the document. (See, Weaver, columns 23-38) See, e.g., the branched polymers of Class I disclosed in column 23 of Weaver, when R<sub>1</sub>, R<sub>2</sub>, R<sub>4</sub>, R<sub>5</sub>, R<sub>7</sub>, R<sub>8</sub>, R<sub>10</sub>, R<sub>11</sub>, R<sub>13</sub>, R<sub>14</sub>, R<sub>16</sub> and R<sub>17</sub> are each an alkyl chain and G<sub>1</sub>, G<sub>2</sub> and G<sub>3</sub> are each hydrogen (or if R<sub>23</sub> is hydrogen and G<sub>1</sub>, G<sub>2</sub> and G<sub>3</sub>, is carboxyl, the hydrophobic/hydrophilic balance will still be hydrophobic due to the presence of the numerous hydrophobic alkyl branches).

Furthermore, Weaver clearly discloses branched polymers that actually *decrease* the permeability of the formation to the flow of water upon having the desired hydrophilic-hydrophobic balance within the formation thereby altering the hydrophilic characteristics of the formation. (Col. 7, lines 6-30; col. 9, lines 49-63) That is, as long as the hydrophilic characteristics of the overall hydrophobic/hydrophilic branched polymer compound have the appropriately adjusted hydrophobic to hydrophilic balance, the compound will reduce (or increase) the water permeability of the formation if said *balance* is hydrophilic. Moreover, the hydrophobically modified water-soluble polymer recited in independent claims 77 and 187 can encompass, e.g., a water-soluble compound having a hydrophilic polymer backbone (with polar heteroatoms), a hydrophobic branch and further containing numerous hydrophilic branches, which can

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provide the sufficient hydrophilicity necessary to decrease formation water permeability as discussed in the section of Weaver cited by Applicant.

Thus, because the instant claims encompass the branched polymer compounds disclosed in Weaver, and methods of using thereof to treat subterranean formations, these claims remain anticipated by Weaver.

*The 35 U.S.C. 103(a) Rejection over Weaver and Waggenpack (item 8 of OA)*

9. Applicant's arguments presented in the "Remarks" section of Response regarding the captioned 35 U.S.C. 103 rejection as unpatentable over Weaver in view of Waggenpack have been fully considered but deemed unpersuasive.

Applicant's sole argument is that because Weaver does not teaches a method of using a hydrophobically-branched water-soluble polymer to reduce permeability, then Waggenpack in combination with Weaver cannot supply this element of independent claims 77 and 187. However, as shown above in the immediately preceding paragraph, the disclosure in Weaver does encompass methods of using hydrophobically modified hydrophilic polymers having a hydrophilic/hydrophobic balance that can reduce the permeability of the subterranean formation to water upon injection into said formation, in accordance with independent claims 77 and 187.

Thus, the instant claims remain anticipated by Weaver and Waggenpack.



***Conclusion***

10. Applicant's submission of an information disclosure statement under 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17(p) on April 16, 2007 prompted the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 609.04(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

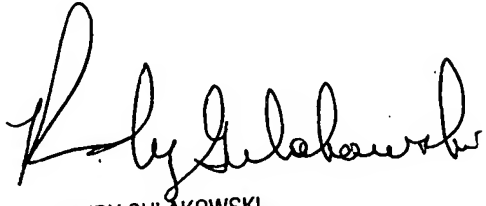
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John J. Figueroa whose telephone number is (571) 272-8916. The examiner can normally be reached on Mondays-Thursdays 8:00-6:00pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on (571) 272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JJF/RAG



RANDY GULAKOWSKI  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700